HEWLETT-PACKARD COMPANY
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PATENT APPLICATION

ATTORNEY DOCKET NO. **200209305-1**

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): **Chungtang TANG et al.**

Confirmation No.: **9230**

Application No.: **10/666,621**

Examiner: **Douglas B. BLAIR**

Filing Date: **September 19, 2003**

Group Art Unit: **2442**

Title: UTILIZING PROXIMITY INFORMATION IN AN OVERLAY NETWORK

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on January 26, 2009.

☒ The fee for filing this Appeal Brief is $540.00 (37 CFR 41.20).

☐ No Additional Fee Required.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

☐ 1st Month $130
☐ 2nd Month $490
☐ 3rd Month $1110
☐ 4th Month $1730

☐ The extension fee has already been filed in this application.

☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of $ 540. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees.

Respectfully submitted,

Chungtang TANG et al.

By

Ashok K. Mannava

Attorney/Agent for Applicant(s)

Reg No. : 45,301

Date : March 23, 2009

Telephone : (703) 652-3822

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Chungtang TANG et al. **Confirmation No.:** 9230

Serial No.: 10/666,621 **Examiner:** Douglas B. BLAIR

Filed: September 19, 2003 **Group Art Unit:** 2442

Title: UTILIZING PROXIMITY INFORMATION IN AN OVERLAY NETWORK

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF - PATENTS

Sir:

This is an Appeal Brief in connection with the decisions of the Examiner in a Final Office Action mailed November 26, 2008, and in connection with the Notice of Appeal filed on January 26, 2009. It is respectfully submitted that the present application has been more than twice rejected. Each of the topics required in an Appeal Brief and a Table of Contents are presented herewith and labeled appropriately.

TABLE OF CONTENTS

(1) Real Party in Interest 3

(2) Related Appeals And Interferences 3

(3) Status of Claims 3

(4) Status of Amendments 3

(5) Summary of Claimed Subject Matter 3

(6) Grounds of Rejection to be Reviewed on Appeal 7

(7) Arguments 8

A. The rejection of claims 1-3, 5, 9-14 and 23-25 under 35 U.S.C. §102(e) should be reversed for failure to teach all the claimed features. 8

B. The rejection of claim 4 under 35 U.S.C. §103(a) as being unpatentable over Lu Zhang should be reversed. 11

C. The rejection of claims 26 and 27 under 35 U.S.C. §112 2nd paragraph should be reversed. 13

(8) Conclusion 14

(9) Claim Appendix 15

(10) Evidence Appendix 22

(11) Related Proceedings Appendix 23

(1) Real Party in Interest

The real party in interest is Hewlett-Packard Development Company, L.P.

(2) Related Appeals and Interferences

The Appellant is unaware of any appeals or interferences related to this case.

(3) Status of Claims

Claims 1-16 and 23-27 are pending in the present application of which claims 1, 9 and 23 are independent. Claims 17-22 are canceled. Claims 1-5, 9-14 and 23-27 are all rejected and are all appealed.

(4) Status of Amendments

No amendment was filed subsequent to the Final Office Action dated November 26, 2008.

(5) Summary of Claimed Subject Matter

Support for the following claims is at least provided in the cited sections.

1. A method of identifying a close-by node in a region of an overlay network, wherein the overlay network is a logical representation of a physical network, the method comprising:

determining first proximity information associated with a location of a first node in the physical network; See page 16, lines 4-20 and figure 5A.

searching through a map associated with a region of the overlay network using the first proximity information, wherein the map includes proximity information associated with locations of nodes physically close in the physical network; See page 16, lines 4-20 and figure 5A.

identifying a routing node in the region of the overlay network based on the searching through the map, wherein the routing node is a node in the region physically closest to the first node in the physical network relative to other nodes in the region. See page 16, lines 4-20 and figure 5A.

2. The method of claim 1, wherein searching through a map associated with a region of the overlay network using the first proximity information, further comprises:

comparing proximity information in the map associated with a plurality of nodes in the overlay network to the first proximity information to identify the node in the region physically closest to the first node in the physical network. See page 16, lines 4-20 and figure 5A.

4. The method of claim 3, wherein the overlay network is an expressway, content-addressable, overlay network, and the first node and the routing node are expressway routing nodes in the overlay network. See page 15, lines 18-19.

9. A method of identifying a node in a region of an overlay network, wherein the overlay network is a logical representation of a physical network, the method comprising:

determining first proximity information associated with a location of a source node in the physical network; See page 17, line 10-page 18, line 11 and figure 5B.

searching through a map associated with a target region of the overlay network using the first proximity information, wherein the map includes proximity information associated with locations of nodes physically close in the physical network; and See page 17, line 10-page 18, line 11 and figure 5B.

identifying a subset of nodes in the target region closest to the first node in the physical network based on the searching through the map. See page 17, line 10-page 18, line 11 and figure 5B.

10. The method of claim 9, further comprising:

determining distances from the source node to the subset of nodes; and selecting from the subset of nodes a node closest to the source node in the physical network based on the determined distances. See page 18, lines 19-21.

23. A node in an overlay network, wherein the overlay network is a logical representation of a physical network, the node comprising:

means for determining first proximity information associated with a location of the node in the network; See computer system 800 in figure 8 and page 16, lines 4-20 and figure 5A.

means for searching through a map associated with a region of the overlay network using the first proximity information, wherein the map includes proximity information associated with locations of other nodes physically close in the physical network; and See computer system 800 in figure 8 and page 16, lines 4-20 and figure 5A.

means for identifying a routing node in the region of the overlay network based on the searching through the map, wherein the routing node is a node in the region physically closest to the node relative to other nodes in the region. See computer system 800 in figure 8 and page 16, lines 4-20 and figure 5A.

26. The method of claim 1, further comprising:

for each of the first node and the nodes in the region, identifying an overlay node based on the proximity information of the respective node; and See page 11, lines 14-21 and figure 4.

for each of the first node and the nodes in the region, storing the proximity information in the respective overlay node, wherein nodes physically close based on their proximity information are stored in overlay nodes that are close in the overlay network. See page 11, lines 14-21 and figure 4.

27. The method of claim 26, further comprising:

retrieving the map from the overlay node storing the proximity information for one or more of the nodes in the region. See page 11, lines 14-21 and figure 4.

(6) Grounds of Rejection to be Reviewed on Appeal

A. Claims 1-3, 5, 9-14 and 23-25 are rejected under 35 U.S.C. §102(e) as allegedly being anticipated by Lu et al.

B. Claim 4 is rejected under 35 U.S.C. §103(a) as being unpatentable over Lu et al. U.S. Patent 6,980,524, in view of the Paper entitled "Building Low-maintenance Expressways for P2P Systems" by Zhang.

C. Claims 26 and 27 are rejected under 35 U.S.C. §112 second paragraph.

(7) Arguments

A. The rejection of claims 1-3, 5, 9-14 and 23-25 under 35 U.S.C. §102(e) should be reversed for failure to teach all the claimed features.

The test for determining if a reference anticipates a claim, for purposes of a rejection under 35 U.S.C. § 102, is whether the reference discloses all the elements of the claimed combination, or the mechanical equivalents thereof functioning in substantially the same way to produce substantially the same results. As noted by the Court of Appeals for the Federal Circuit in *Lindemann Maschinenfabrick GmbH v. American Hoist and Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984), in evaluating the sufficiency of an anticipation rejection under 35 U.S.C. § 102, the Court stated:

> Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim.

Therefore, if the cited reference does not disclose each and every element of the claimed invention, then the cited reference fails to anticipate the claimed invention and, thus, the claimed invention is distinguishable over the cited reference.

Claims 1-3, 5, 9-14 and 23-25 were rejected under 35 U.S.C. §102(e) as allegedly being anticipated by Lu et al. (6,980,524), referred to as Lu.

Independent claim 1 recites,

> identifying a routing node in the region of the overlay network based on the searching through the map, wherein the routing node is a node in the region physically closest to the first node in the physical network relative to other nodes in the region.

Lu fails to teach identifying a routing node that is physically closest to the first node relative to other nodes in the region based on the search through the map. The Examiner cites to column 8, lines 31-60 as allegedly teaching all the features of claim 1. This passage of Lu simply describes two levels of network topology, which are node level and zone level. It also describes physical communication links between nodes and virtual communication links between zones. Neither this passage nor any other disclosure in Lu teaches identifying a routing node that is physically closest to the first node relative to other nodes in the region based on the search through the map.

Page 2 of the Final Office Action indicates that this feature is taught by the shortest path algorithm disclosed in column 10, lines 53-67 of Lu. Lu discloses that a shortest path algorithm may be used to build an intra-zone routing table. In column 11, lines 4-8, Lu further discloses the shortest path algorithm may also be used to build the inter-zone routing table to find the shortest path in terms of zone hops. Thus, the shortest path algorithm determines shortest paths in terms of number hops, whereby the hops are intra-zone or inter-zone. Lu does not disclose the shortest path algorithm determines a physically closest node or determines distances between nodes. A shortest path in terms of hops as referred to by the shortest path algorithm is an end-to-end path between source and destination with the least number of hops rather than physically closest nodes.

It should be noted that the Examiner on page 2 of the Final Office Action agreed that there are differences between the Applicants' invention and the prior art, but the Examiner did not believe the claim feature described above is sufficient to distinguish over the shortest path algorithm of Lu. However, the Appellants respectfully disagree for the reasons stated above.

Dependent claim 2 recites,

> comparing proximity information in the map associated with a plurality of nodes in the overlay network to the first proximity information to identify the node in the region physically closest to the first node in the physical network.

Lu fails to teach identifying a physically closest node to the first node by comparing proximity information in the map to proximity information for the first node. In Lu, no proximity information comparison is performed. Also, no identification of a physically closest node is made.

Independent claim 9 recites, "identifying a subset of nodes in the target region closest to the first node in the physical network based on the searching through the map." Lu fails to teach identifying a subset of closest nodes.

Dependent claim 10 recites,

> determining distances from the source node to the subset of nodes; and
> selecting from the subset of nodes a node closest to the source node in the physical network based on the determined distances.

Lu fails to teach determining distances between nodes, and hence, fails to teach selecting a subset of closest nodes based on determined distances.

Independent claim 23 recites,

> means for identifying a routing node in the region of the overlay network based on the searching through the map, wherein the routing node is a node in the region physically closest to the node relative to other nodes in the region.

Lu fails to teach these features for the reasons stated with respect to claim 1.

For at least these reasons, the rejection of claims 1-3, 5, 9-14 and 23-25 should be reversed.

B. The rejection of claim 4 under 35 U.S.C. §103(a) as being unpatentable over Lu Zhang should be reversed.

The test for determining if a claim is rendered obvious by one or more references for purposes of a rejection under 35 U.S.C. § 103 is set forth in *KSR International Co. v. Teleflex Inc.*, 550 U.S._, 82 USPQ2d 1385 (2007):

> "Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." Quoting *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966).

As set forth in MPEP 2143.03, to ascertain the differences between the prior art and the claims at issue, "[a]ll claim limitations must be considered" because "all words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385. According to the Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in view of *KSR International Co. v. Teleflex Inc.*, Federal Register, Vol. 72, No. 195, 57526, 57529 (October 10, 2007), once the *Graham* factual inquiries are resolved, there must be a determination of whether the claimed invention would have been obvious to one of ordinary skill in the art based on any one of the following proper rationales:

> (A) Combining prior art elements according to known methods to yield predictable results; (B) Simple substitution of one known element for another to obtain predictable results; (C) Use of known technique to improve similar devices (methods, or products) in the same way; (D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; (E) ''Obvious to try''—choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; (F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art; (G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention. *KSR International Co. v. Teleflex Inc.*, 550 U.S._, 82 USPQ2d 1385 (2007).

Furthermore, as set forth in *KSR International Co. v. Teleflex Inc.*, quoting from *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006), "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasonings with some rational underpinning to support the legal conclusion of obviousness."

Therefore, if the above-identified criteria and rationales are not met, then the cited reference(s) fails to render obvious the claimed invention and, thus, the claimed invention is distinguishable over the cited reference(s).

Claim 4 is rejected under 35 U.S.C. §103(a) as being unpatentable over Lu et al. U.S. Patent 6,980,524, in view of the Paper entitled "Building Low-maintenance Expressways for P2P Systems" by Zhang.

Zhang was cited to teach an expressway content-addressable overlay network. However, Zhang fails to teach or suggest determining a physically closest node or determining distances as recited in the claimed features described above. Accordingly, Zhang does not remedy the deficient teachings of Lu, and the rejection of claim 4 should be reversed at least for the reasons the rejection of claim 1 should be reversed.

C. The rejection of claims 26 and 27 under 35 U.S.C. §112 2nd paragraph should be reversed.

Claim 26 recites, "for each of the first node and the nodes in the region, storing the proximity information in the respective overlay node, wherein nodes physically close based on their proximity information are stored in overlay nodes that are close in the overlay network."

Claim 26 was rejected because of the claimed feature "nodes physically close are stored in overlay nodes that are close." The rejection asserts that it is unclear how nodes can be stored in overlay nodes, and further states, "It is believed by the Examiner ... trying to claim the position of the nodes and not the nodes themselves being stored." The Examiner is correct in the interpretation that the claim should be interpreted to be storing the claimed proximity information in the overlay nodes, and it is believed that the claim as interpreted by the Examiner in light of the specification is not indefinite.

Claim 27 was rejected due to its dependency on claim 26.

(8) Conclusion

For at least the reasons given above, the rejections of claims 1-5, 9-14 and 23-27 described above should be reversed and these claims allowed.

Please grant any required extensions of time and charge any fees due in connection with this Appeal Brief to deposit account no. 08-2025.

Respectfully submitted,

Dated: March 23, 2009

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(9) Claim Appendix

1. (Original) A method of identifying a close-by node in a region of an overlay network, wherein the overlay network is a logical representation of a physical network, the method comprising:

determining first proximity information associated with a location of a first node in the physical network;

searching through a map associated with a region of the overlay network using the first proximity information, wherein the map includes proximity information associated with locations of nodes physically close in the physical network;

identifying a routing node in the region of the overlay network based on the searching through the map, wherein the routing node is a node in the region physically closest to the first node in the physical network relative to other nodes in the region.

2. (Original) The method of claim 1, wherein searching through a map associated with a region of the overlay network using the first proximity information, further comprises:

comparing proximity information in the map associated with a plurality of nodes in the overlay network to the first proximity information to identify the node in the region physically closest to the first node in the physical network.

3. (Original) The method of claim 1, further comprising:

storing routing information for the routing node in a routing table for the first node, such that messages transmitted to the region of the routing node are transmitted to the routing node in the region from the first node wherein the first node is located in another region in the overlay network.

4. (Original) The method of claim 3, wherein the overlay network is an expressway, content-addressable, overlay network, and the first node and the routing node are expressway routing nodes in the overlay network.

5. (Original) The method of claim 1, further comprising storing the map in nodes logically close in the overlay network, such that the proximity information in the map for the nodes physically close in the physical network is stored in the nodes logically close in the overlay network.

6. (Original) The method of claim 1, further comprising generating the proximity information for the map by performing steps of:

selecting landmark nodes in the physical network;

determining distances to the landmark nodes for the nodes in the overlay network;

determining landmark vectors for the nodes in the overlay network based on the determined distances to the landmark nodes;

mapping the landmark vectors to points in the region in the overlay network; and storing the landmark vectors at nodes associated with the points in the region as the proximity information for the map.

7. (Original) The method of claim 6, wherein selecting landmark nodes in the physical network comprises randomly selecting nodes in the physical network to be the landmark nodes.

8. (Original) The method of claim 6, wherein mapping the landmark vectors to points in the region in the overlay network further comprises:

assigning landmark numbers to grids in a landmark space;

identifying a grid of the grids where each landmark vector is located in the landmark space;

assigning one of the landmark numbers to each of the landmark vectors based on the grid where the a respective landmark vector is located; and

mapping the landmark numbers from the landmark space to the overlay network using a space filling curve, wherein the landmark space is an n-dimensional space and the overlay network is an m-dimensional space, and n>m.

9. (Original) A method of identifying a node in a region of an overlay network, wherein the overlay network is a logical representation of a physical network, the method comprising:

determining first proximity information associated with a location of a source node in the physical network;

searching through a map associated with a target region of the overlay network using the first proximity information, wherein the map includes proximity information associated with locations of nodes physically close in the physical network; and

identifying a subset of nodes in the target region closest to the first node in the physical network based on the searching through the map.

10. (Original) The method of claim 9, further comprising:

determining distances from the source node to the subset of nodes; and

selecting from the subset of nodes a node closest to the source node in the physical network based on the determined distances.

11. (Original) The method of claim 10, further comprising:

entering the selected closest node in a routing table for the source node, wherein the selected closest node is used by the source node to route messages to the target region.

12. (Original) The method of claim 9, further comprising generating proximity information for nodes in the overlay network, the generated proximity information

including the first proximity information and the proximity information for the map, wherein generating the proximity information comprises:

selecting landmark nodes in the physical network;

determining distances from a substantial number of nodes in the overlay network to the landmark nodes;

determining locations in the physical network for the substantial number of nodes based on the determined distances to the landmark nodes.

13. (Original) The method of claim 12, wherein the locations comprise landmark vectors for the substantial number of nodes, wherein the landmark vectors include components representing distances from each of the substantial number of nodes to each of the landmark nodes.

14. (Original) The method of claim 9, further comprising:

identifying a location of a node in the target region in the overlay network storing the map; and

transmitting a map lookup request to the node in the target region.

15. (Original) The method of claim 14, wherein identifying a location of a node in the target region storing the map further comprises hashing a landmark number associated with the target region using a hash function.

16. (Original) The method of claim 15, wherein the hash function comprises a space filling curve.

17-22. (Canceled)

23. (Original) A node in an overlay network, wherein the overlay network is a logical representation of a physical network, the node comprising:

means for determining first proximity information associated with a location of the node in the network;

means for searching through a map associated with a region of the overlay network using the first proximity information, wherein the map includes proximity information associated with locations of other nodes physically close in the physical network; and

means for identifying a routing node in the region of the overlay network based on the searching through the map, wherein the routing node is a node in the region physically closest to the node relative to other nodes in the region.

24. (Original) The node of claim 23, wherein the node comprises means for storing routing information for the routing node in a routing table, such that messages transmitted to the region of the routing node are transmitted to the routing node.

25. (Original) The node of claim 23, further comprising:

means for storing the map for the region; and

means for updating the stored map in response to detecting predetermined changes to the network.

26. (New) The method of claim 1, further comprising:

for each of the first node and the nodes in the region, identifying an overlay node based on the proximity information of the respective node; and

for each of the first node and the nodes in the region, storing the proximity information in the respective overlay node, wherein nodes physically close based on their proximity information are stored in overlay nodes that are close in the overlay network.

27. (New) The method of claim 26, further comprising:

retrieving the map from the overlay node storing the proximity information for one or more of the nodes in the region.

(10) Evidence Appendix

None.

(11) Related Proceedings Appendix

None.